Asthma in New Hampshire

How does asthma affect communities in New Hampshire?

WHAT IS ASTHMA?

Asthma is a chronic lung disease that has been increasing in prevalence in the United States since 1980. Asthma involves swelling and inflammation of the airways, reversible airway obstruction, and muscle spasms around the airways in response to a variety of triggers. Anyone can have asthma, at any age. The main symptoms of asthma are cough, chest tightness, wheezing (a whistling, high-pitched noise coming from the chest) and shortness of breath. Asthma cannot be cured but it can be controlled. With proper care, people who have asthma can live healthy, active lives.

ASTHMA IN NEW HAMPSHIRE

Current data on asthma appear in the recently published report, *Asthma in New Hampshire, 1990-2004*, which can be found at www.asthmanow.net and http://www.dhhs.state.nh.us/DHHS/CDPC/asthma.htm. This brief contains updated information on: prevalence, hospitalizations and emergency department visits by county.

New Hampshire and other states in New England have some of the highest prevalence rates of asthma in the nation.

PREVALENCE OF ASTHMA

There are no statistically significant differences between the asthma prevalence rates in New Hampshire counties and the state rate or between the state prevalence rate and the rates in the cities of Manchester and Nashua.

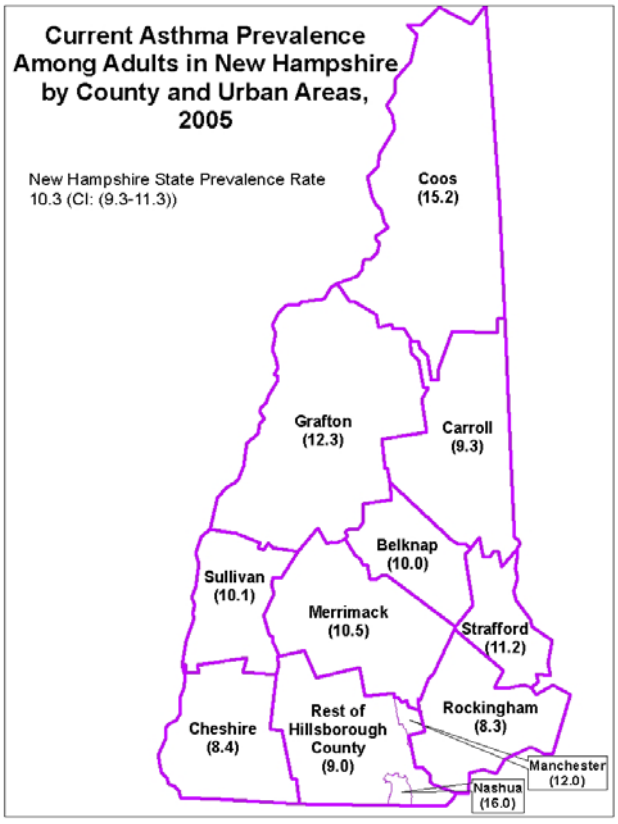
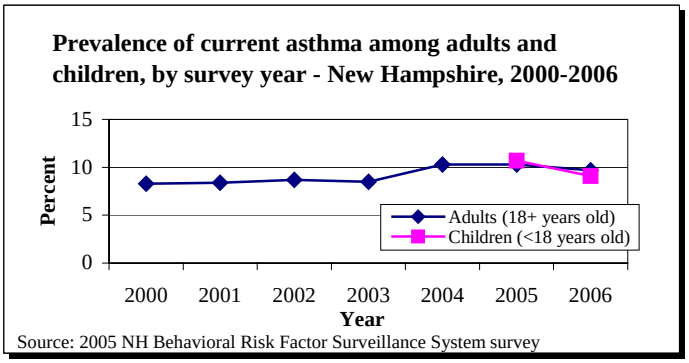


Table 1. Prevalence of current asthma among adults, by county and urban areas – New Hampshire 2005

County	Prevalence Rate*	95% CI
Belknap	10.0	(5.9-14.1)
Carroll	9.3	(5.5-13.2)
Cheshire	8.4	(5.6-11.1)
Coos	15.2	(10.5-19.8)
Grafton	12.3	(8.1-16.6)
Hillsborough	11.1	(9.1-13.1)
Merrimack	10.5	(7.7-13.3)
Rockingham	8.3	(6.4-10.1)
Strafford	11.2	(8.1-14.3)
Sullivan	10.1	(6.5-13.7)
Urban areas		
Manchester	12.0	(8.0-16.0)
Nashua	16.0	(10.7-21.3)
Rest of Hillsborough County	9.0	(6.8-11.1)
State Prevalence Rate	10.3	(9.3-11.3)

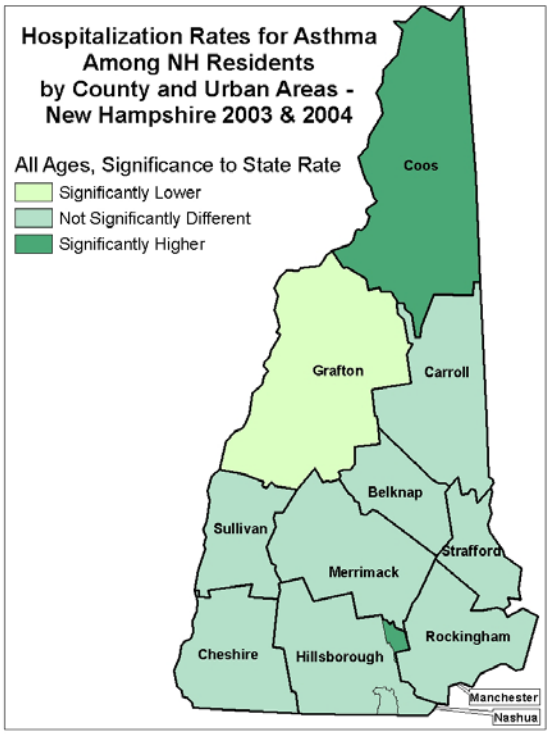
*Rates per 100 NH Residents
Source: 2005 NH Behavioral Risk Factor Surveillance System survey



Source: 2005 NH Behavioral Risk Factor Surveillance System survey

The prevalence of asthma among adults in New Hampshire appears to have increased since the year 2000, and prevalence among children appears to be as high as it is among adults: in 2006, the prevalence of current asthma was 9.7 among adults and 9.1 for children.

HOSPITALIZATIONS DUE TO ASTHMA



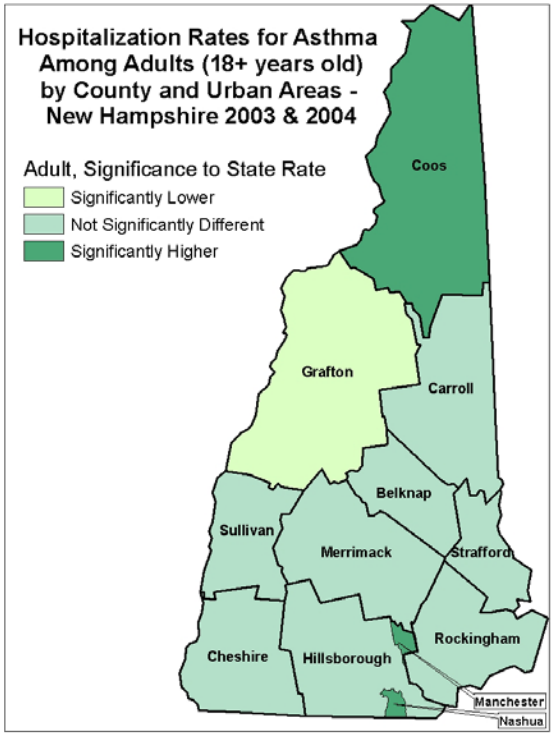
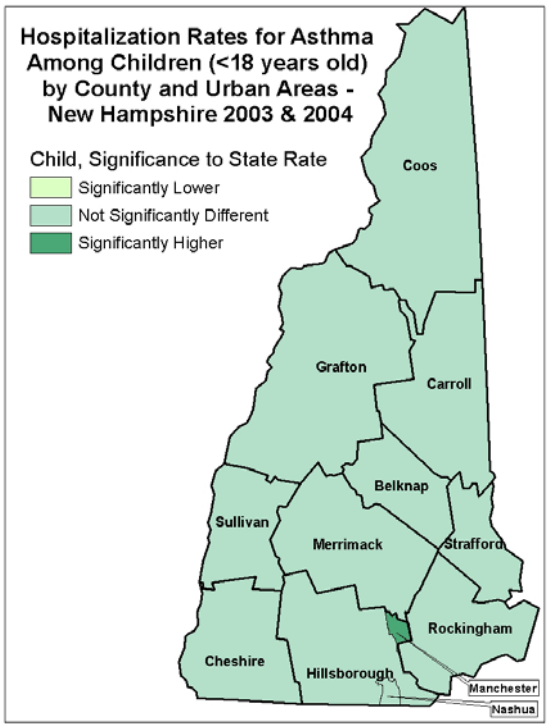


Table 2. Hospitalization rates for asthma, by county and urban areas – New Hampshire 2003 & 2004

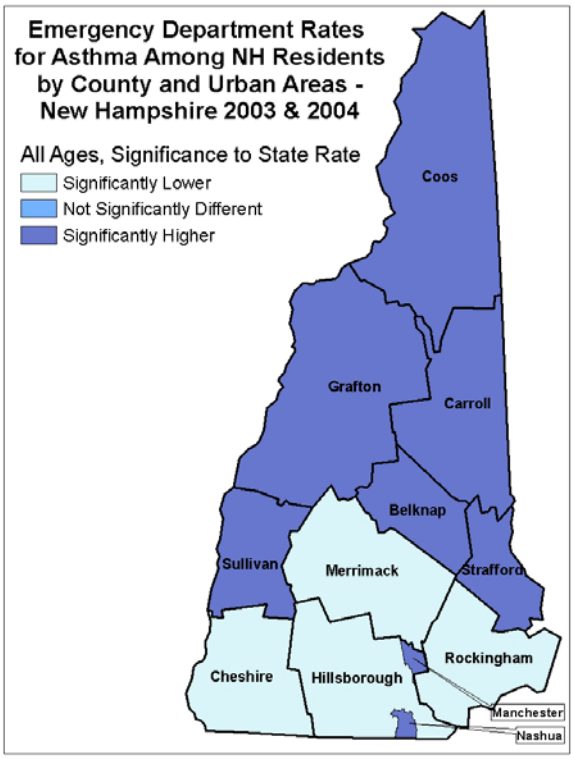
	All age groups		Adults 18+		Children <18	
County	Age adjusted rates*	95% CI	Age specific rates*	95% CI	Age specific rates*	95% CI
Belknap	7.6	(6.1-9.3)	7.2	(5.6-9.1)	8.3	(5.2-12.6)
Carroll	6.6	(5.1-8.5)	6.2	(4.6-8.3)	8.8	(5.1-14.1)
Cheshire	6.7	(5.5-8.2)	6.1	(4.8-7.7)	7.5	(4.8-11.1)
Coos	10.7	(8.5-13.4)	12.0	(9.2-15.3)	9.8	(5.4-16.5)
Grafton	5.4	(4.3-6.6)	5.3	(4.1-6.6)	5.8	(3.5-9.0)
Hillsborough	10.1	(9.4-10.9)	10.3	(9.5-11.1)	9.5	(8.2-10.9)
Merrimack	7.8	(6.8-8.8)	8.2	(7.0-9.4)	6.9	(5.1-9.2)
Rockingham	7.4	(6.6-8.1)	6.8	(6.0-7.6)	8.2	(6.8-9.7)
Strafford	6.6	(5.6-7.7)	6.7	(5.5-7.9)	5.4	(3.6-7.8)
Sullivan	6.8	(5.2-8.7)	8.0	(5.9-10.4)	4.2	(1.8-8.2)
Urban areas						
Manchester	14.7	(13.1-16.3)	15.3	(13.4-17.2)	12.7	(9.8-16.3)
Nashua	9.6	(8.2-11.1)	9.8	(8.1-11.5)	9.1	(6.4-12.5)
Rest of Hillsborough County	7.9	(7.0-8.9)	7.6	(6.6-8.6)	8.2	(6.5-9.9)
State Rate	8.0	(7.7-8.4)	8.0	(7.6-8.4)	8.0	(7.3-8.7)

*Rates are per 10,000 NH residents
Source: New Hampshire Inpatient Hospital Discharge Data



Note: Numbers in this document may be different from previous publications because New Hampshire residents who were hospitalized in Maine, Massachusetts and Vermont are included in this analysis – these data were not available for previous reports. For Hillsborough County, the map colors represent the rates of asthma hospitalizations for Manchester, Nashua and the rest of Hillsborough County compared with the state rate.

EMERGENCY DEPARTMENT VISITS DUE TO ASTHMA



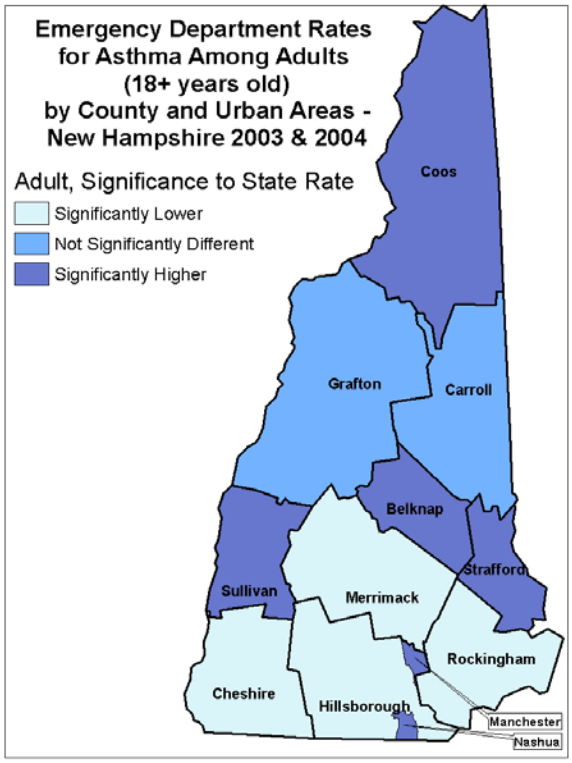
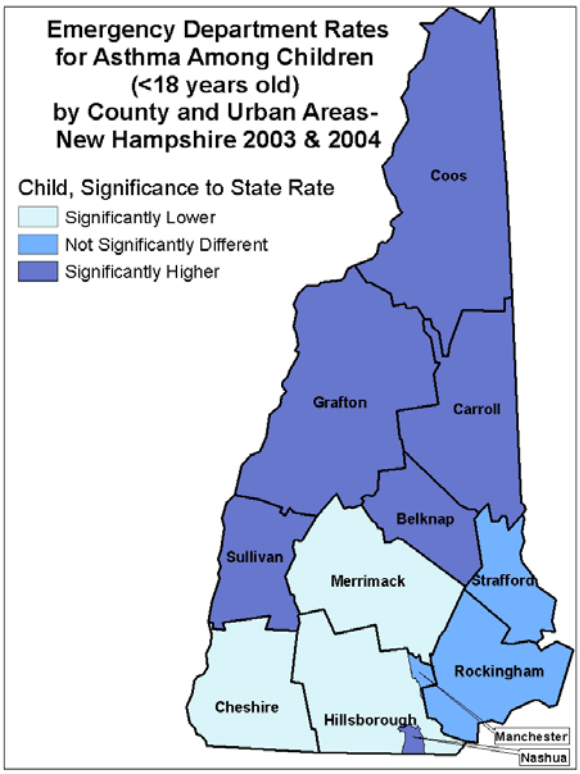


Table 3. Emergency department rates for asthma, by county and urban areas – New Hampshire 2003 & 2004

	All age groups		Adults 18+		Children <18	
County	Age adjusted rates*	95% CI	Age specific rates*	95% CI	Age specific rates*	95% CI
Belknap	67.0	(62.2-71.9)	55.6	(50.8-60.3)	85.2	(74.1-96.3)
Carroll	60.5	(55.5-66.0)	47.0	(42.0-52.0)	77.2	(64.8-89.6)
Cheshire	38.1	(34.9-41.4)	33.0	(29.7-36.2)	48.5	(41.1-56.0)
Coos	70.8	(64.0-77.7)	55.8	(49.4-62.1)	93.5	(77.6-109.4)
Grafton	54.9	(51.1-58.6)	47.3	(43.6-51.0)	68.5	(59.8-77.2)
Hillsborough	49.1	(47.6-50.7)	49.7	(47.9-51.5)	44.9	(42.0-47.8)
Merrimack	42.2	(39.8-44.6)	40.3	(37.6-42.9)	42.5	(37.6-47.4)
Rockingham	43.7	(41.9-45.4)	40.5	(38.6-42.4)	48.1	(44.6-51.7)
Strafford	57.2	(54.1-60.2)	56.8	(53.3-60.3)	61.4	(54.8-68.1)
Sullivan	75.7	(69.5-81.8)	71.4	(64.9-77.8)	67.7	(56.0-79.3)
Urban areas						
Manchester	70.7	(67.2-74.3)	75.0	(70.8-79.1)	56.7	(50.1-63.3)
Nashua	59.4	(55.7-63.0)	57.0	(52.9-61.0)	63.2	(55.6-70.8)
Rest of Hillsborough County	33.2	(31.4-35.1)	31.8	(29.8-33.9)	32.4	(29.0-35.8)
State Rate	49.9	(49.0-50.7)	47.1	(46.2-48.1)	53.0	(51.1-54.8)

*Rates are per 10,000 NH residents
Source: New Hampshire Inpatient Hospital Discharge Data



Note: Numbers in this document may be different from previous publications because New Hampshire residents who visited an emergency department in Maine, Massachusetts and Vermont are included in this analysis – these data were not available for previous reports. For Hillsborough County, the map colors represent the rates of asthma emergency department use for Manchester, Nashua and the rest of Hillsborough County compared with the state rate.

CHARGES FOR ASTHMA HOSPITALIZATIONS AND EMERGENCY DEPARTMENT VISITS

Table 4. Charges for asthma hospitalizations and emergency department visits by county and urban areas – New Hampshire 2004

	Hospitalizations				Emergency Department Visits			
		Charges (dollars*)				Charges (dollars*)		
County	N**	Mean	Median	Total	N**	Mean	Median	Total
Belknap	46	7,492	5,518	344,633	366	815	815	298,356
Carroll	32	7,448	5,021	238,343	234	612	562	143,112
Cheshire	49	8,306	5,484	406,994	263	653	509	171,630
Coos	34	6,683	5,773	227,238	222	721	601	160,065
Grafton	55	7,539	4,006	414,657	424	488	391	206,813
Hillsborough	414	7,755	5,826	3,210,373	1785	784	637	1,399,611
Merrimack	112	10,250	7,454	1,148,007	544	850	767	462,615
Rockingham	195	10,248	7,047	1,998,268	1158	672	536	778,596
Strafford	78	8,464	6,264	660,173	606	544	423	329,835
Sullivan	31	8,577	5,602	265,888	274	612	459	167,658
Urban areas								
Manchester	173	8,010	5,918	1,385,652	705	832	681	586,383
Nashua	94	7,828	5,620	735,785	500	726	586	363,141
Rest of Hillsborough County	147	7,408	5,838	1,088,936	580	776	636	450,087
NH State Rate	1046	8,523	6,100	8,914,574	5876	701	571	4,118,291

*Unadjusted dollars **N= Number of visits
Source: New Hampshire Inpatient and Outpatient Hospital Discharge Data

RESULTS

Prevalence:
The prevalence of asthma is not statistically significantly higher in any one county or urban area than in the State as a whole.

Hospitalizations:
Hospitalization rates for asthma among all New Hampshire residents are statistically significantly higher in Coos County and the city of Manchester as compared with the state rate; they are statistically significantly lower than the state rate in Grafton County.

For adults 18 years and older, hospitalization rates for asthma are statistically significantly higher in Coos County and the cities of Manchester and Nashua, and statistically significantly lower in Grafton County.

For children less than 18 years old, rates are statistically significantly higher in the city of Manchester.

There are no statistically significant differences when comparing asthma hospitalizations for adults and children.

Emergency Department Visits:
Rates of emergency department use for asthma are statistically significantly higher in counties above the southern tier of New Hampshire and urban areas as compared with the state rate; they are statistically significantly lower in counties in the southern tier.

Among adults, emergency department rates for asthma are statistically significantly higher in Belknap, Coos, Sullivan and Strafford Counties as well as in the cities of Manchester and Nashua; they are statistically significantly lower in Cheshire, Merrimack and Rockingham Counties. There is not a statistically significant difference between Hillsborough County and the state rate; however, if data for the cities of Manchester and Nashua are excluded from Hillsborough County, then the rest of Hillsborough County is statistically significantly lower than the state rate.

Rates for children are statistically significantly higher in Belknap, Carroll, Coos, Grafton and Sullivan Counties, and the city of Nashua; they are statistically significantly lower in Cheshire, Merrimack and Hillsborough Counties.

There are statistically significant differences when comparing emergency department use by adults and children; adult rates are higher than rates for children in Hillsborough County and the city of Manchester, while rates for children are higher than for adults in Belknap, Carroll, Cheshire, Coos, Grafton and Rockingham Counties. Overall children appear to have a statistically significantly higher rate of emergency department use than adults in New Hampshire.

Cost:
Merrimack and Rockingham Counties appear to have the highest median charges (>$7,000/visit) for asthma hospitalizations in the State; Grafton County appears to have the lowest (~$4,000/visit).

Belknap and Merrimack Counties appear to have the highest median charges (>$750/visit) for asthma emergency department visits; Grafton County appears to have the lowest (<$400/visit).

The charges for emergency department visits and hospitalizations are a fraction of the total cost of asthma. See the Discussion Section for elaboration.

DISCUSSION

The data in this brief show that though the prevalence of asthma does not vary significantly around the State there is significant variation in hospital and emergency department utilization due to asthma both by geographic area and by age. Generally, counties above the southern tier of the State and urban areas have higher rates of utilization; depending on where they live, children under 18 years are more likely than adults to visit an emergency department, and adults are more likely to be hospitalized.

Nationally nearly 14.5 million missed or lost work days each year are associated with asthma.[1] Asthma is also the leading cause of school absences due to chronic illness; it accounts for an annual loss of more than 14 million school days per year and more hospitalizations than any other childhood disease.[1,2]

Negative outcomes from asthma are largely preventable when both providers and patients comply with national guidelines. The Agency for Healthcare Research and Quality lists both adult and pediatric asthma among sixteen causes of preventable hospitalizations (http://www.qualityindicators.ahrq.gov/).

The National Asthma Education and Prevention Program, National Heart, Lung, and Blood Institute guidelines present clinical, pharmacological, environmental and behavioral priorities that together can keep individuals with asthma healthy and out of the emergency department and hospital. A growing body of evidence shows that successful asthma management, with physicians and patients following national guidelines, can reduce emergency department visits and hospitalizations due to asthma.

The cost of asthma goes beyond the charges an emergency room visit or hospitalization costs and speaks to the burden of asthma in New Hampshire. In 1998, the estimated cost of asthma in New Hampshire was 46 million dollars. This estimate was composed of approximately 26 million dollars in direct medical expenditures and 20 million dollars in indirect costs. Direct medical expenditures include charges for hospitalization, outpatient/emergency department hospital services, physician services, and medications. Indirect costs relate more closely to the burden of disease on individuals and society; these costs include non-medical economic losses such as days missed from school or work, caregiver costs, travel costs, early retirement due to disability, and years of productive life lost due to premature death.[3]

Barriers to Asthma Care and Management

Despite the many improvements in asthma management made possible through advances in clinical practice, pharmacological and environmental management, and asthma education, significant barriers to achieving better outcomes and keeping people out of the emergency department and hospital remain.[4,5] They include:

- Individuals' access to care (e.g., access to regular primary care versus reliance on the emergency department for care)
- Provider adherence to national guidelines for the diagnosis and management of asthma
- Provider-patient communication, adequate asthma education and capacity to access available resources (e.g., asking the right questions to diagnose, frequent asthma education and follow up, knowledge to take maximum advantage of health insurance policies)
- Patient compliance including knowledge of asthma symptoms and appropriate use of medications (e.g., use of rescue versus controller medications)
- Individual health beliefs about asthma medications and the seriousness of the condition (e.g., distrust of steroids, disbelief about the seriousness of consequences if asthma is not managed properly)
- Individual capacity to limit environmental triggers (e.g., secondhand smoke, mold and/or pests in a rented apartment)

These barriers experienced by both physicians and individuals with asthma contribute significantly to morbidity and related costs. The impact of limed or no access to appropriate primary care illustrates the problem well. Uninsured patients, low-income individuals, and those living in rural areas with limited or no access to regular primary care frequently use the emergency department for conditions that do not require immediate treatment or that could be treated in a primary care setting. In the case of asthma, lack of appropriate primary care that follows national guidelines and includes asthma education can lead to poorly managed asthma that may progress to an acute exacerbation, a visit to the emergency department, and possibly a hospital stay. Nationally it is estimated that 72% of emergency department visits for children and 61% of visits for adults could be treated in an outpatient setting. There is little doubt that timely and appropriate primary care and asthma education would help decrease morbidity and acute care charges due to asthma.[6]

Questions That Remain

It is important to note that the state rates reported here represent neither a standard nor a target to be achieved; they are, however, a point of comparison by which to understand hospital and emergency department use in New Hampshire. Thus variations in utilization reported earlier are a starting point for understanding the burden of asthma in New Hampshire and patient outcomes. Additional questions that arise as a result of these data include the extent to which the data may:

- Reflect poorly managed and controlled asthma
- Reflect geographical differences in access to primary care
- Speak to differences in physician practices, decision-making, and referral patterns
- Reflect underlying social and economic differences that affect health and environmental conditions
- Reveal possible geographical differences in environmental pollutants that trigger asthma
- Reflect undetected geographical differences in the prevalence and severity of disease

WHERE TO GO FOR MORE INFORMATION

For more information on the data presented here or to receive a copy of *Asthma in New Hampshire, 1990-2004*, contact the New Hampshire Asthma Control Program at (800) 852-3345 ext. 0856.

Other Resources

- For a copy of the most recent edition of national guidelines for asthma, *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma,* visit the **National Heart, Lung, and Blood Institute** website at **http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf.**
- Go to the **Centers for Disease Control and Prevention** asthma website at **www.cdc.gov/asthma** for data and information on how asthma is being addressed nationwide.
- Visit **www.AsthmaNow.net**, New Hampshire's website for asthma. Sections on asthma care and management, asthma and the environment, asthma and schools, asthma and the home, and resources for parents, children, teens, and providers link to other helpful web pages and sites.
- Take advantage of a variety of educational and advocacy services provided by the **Breathe New Hampshire**. Contact them at: **1-800-835-8647** or go to **www.breathenh.org.**

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[1] Mannino D.M., Homa D.H., Akinbami L.J, et al. Surveillance for Asthma--- United States, 1980-1999. MMWR. March 2002, 51(SS01); 1-13.
[2] "The Cost of Asthma," Asthma and Allergy Foundation 1992 and 1998 Study, 2000 Update.
[3] Asthma and Allergy Foundation of America. Cost of asthma. Available at: www.aafa.org/display.cfm?id=6&sub=63&cont=142. Accessed January 6, 2006.
[4] Mansour M.E, Lanphear B.P, and DeWitt T.G. Barriers to Asthma Care in Urban Children: Parent Perspectives. *Pediatrics*. 2000, 106 (3) 512-519.
[5] Valerio M, Cabana M.D., White D.F, Heidmann D.M., Brown R.W. and Bratton S.L. Understanding of Asthma Management: Medicaid Parents' Perspectives. *Chest*. 2006;129;594-601.
[6] Parker S.G. Reducing Emergency Room Use by Low-Income Patients May Improve Their Health. Findings from a grant funed by Robert Wood Johnson Foundation. Available at: www.rwjf.org/programareas/resources/grantsreport.jsp?filename=026673.htm&pid=1144. Accessed on June 1, 2007.